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Seventy-six presents were announced as having been received since the last meeting, including, amongst others,

J. Woodbridge Davis, The Dynamics of the Sun, presented by Mr. G. F. Chambers; Description of the Star Camera at the Sydney Observatory, and enlarged photograph of the region surrounding the η *Argûs* nebula, presented by Mr. H. C. Russell; Observations of Double Stars, part 2, and the orbit of *Iapetus*, by Asaph Hall, presented by the author; H. Jacoby, The Rutherfurd photographic measures of the group of the *Pleiades*, presented by the author; First and Second Reports of the Solar Physics Committee, presented by the Committee; Tables de Logarithmes à huit décimales, presented by the French War Office; S. Glasenapp, Mesures d'étoiles doubles, presented by the author; Two lantern slides of the region surrounding Nova *Aurigæ*, presented by the Lick Observatory; Photographs of double stars (lantern slide) to illustrate method of determining star magnitudes by photography, presented by Mr. W. E. Wilson; Photographs of the globular cluster 15 M *Pegasi*, and of the nebula ♅ V 15, near 52 *Cygni*, presented by Mr. Roberts.

The Opposition of Mars, 1892. By E. J. Stone, M.A., F.R.S., Radcliffe Observer.

A circular has been recently issued from the Washington Observatory, in which a scheme is formulated for meridian observations of *Mars* from 1892, June 20, to September 23, for a redetermination of the constant of solar parallax.

The horizontal equatorial parallax of *Mars* at the opposition of 1892 reaches a limit of $23''\cdot4$; but the planet has a considerable south declination, and this will somewhat reduce the combined parallactic displacements available from observations made at the northern and southern observatories, increase the probable errors of the observations, and render it more difficult to completely eliminate the effects of refraction errors by the observations of comparison stars than was the case in 1862 and 1877; but a result of considerable weight might probably be obtained if the co-operation of several southern and northern observatories could be secured, and the same comparison stars regularly observed at all the stations under the same instrumental conditions as the planet.

But the necessary co-operation has been rendered doubtful by the shortness of the notice given, which renders any modification of details difficult, and by the recommendation of a scheme of observation of a somewhat complicated character.

The method of determining the constant of solar parallax from meridian observations of *Mars* has always appeared to me one of the most powerful available for the purpose, and on the following grounds, viz.:—

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1. The observations can be made by experienced observers, with instruments which they are accustomed to use, in the course of their regular duties, without the necessity of any change of methods of observation, and without any unusual strain or excitement.

2. Any outstanding errors of the refraction tables in use can be practically eliminated by the observation of comparison stars of greater and lesser zenith distance than the planet on each night at all the stations.

3. Any outstanding errors of division, or errors of flexure corrections, may be eliminated in mean results in a similar manner.

4. The observations can be made by so many different observers, with so many different instruments, that the effects of any ordinary systematic errors of meridian observations need not be feared.

5. The observations can be repeated at frequent intervals without any great disorganisation of the regular work of the meridian observatories.

6. The available parallactic displacements of *Mars* at favourable oppositions are so large, that an error of one per cent. in the adopted value of the constant of solar parallax will lead to discordances between theory and observation of more than a quarter of a second of arc, a quantity which much exceeds the ordinary accidental errors to be expected in the mean results derived from the observations which may be obtained at a single opposition.

7. The required constant of solar parallax is derived from a discussion of observations made under the same conditions, with the same instruments, and by the same observers, as those employed for the determination of the other constants which appear in the theoretical expressions in combination with the constant of solar parallax.

In the Washington Circular it is proposed to fix the position of the planet *Mars* by the method, introduced by Dr. Winnecke in 1862, of equal segments.

The adoption of this method requires that a system of parallel wires, movable by the declination-screw, should be placed in the eye-pieces at a distance apart somewhat less than the diameter of the planet at the opposition. This distance would in 1892 be about 16″. But no such wires are usually found in the eye-pieces of the transit-circles of meridian observatories; and the method of equal segments is not one with which meridian observers, in general, are familiar.

It is quite possible that observers who have had much experience with the method of equal segments might fix the position of the centre of *Mars* by this method with a slightly greater accuracy than by the more usual method of contacts; but it is at least very doubtful whether such will be the case with respect to observers who have had experience with the method of contacts, but not with that of equal segments; and

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the introduction of the two wires to fix the position of the centre of the planet renders it absolutely necessary that the observations of the comparison stars should be equally distributed between the two wires on each night of observation, a condition which in practice cannot always be secured, from passing clouds.

But in the Washington Circular it is also proposed that a reflecting prism should be mounted outside the eye-piece, and that the observations of *Mars* and stars should be made half with, and half without, the use of the reflecting prism.

I fear that attempts to carry out this scheme will lead to greater systematic errors in fixing the relative differences in North Polar Distance between the centre of *Mars* and the comparison stars, from a want of symmetrical distribution of the observations of the stars between the two wires, than can be compensated for by any possible increase of accuracy from the use of the two wires and the reflecting prism.

The removal of the eye-piece for the insertion of a new pair of wires, the redetermination of the intervals and inclination of the wires, and the loss of observations which this will cause, must disorganise the work of an active meridian observatory to an extent which is hardly likely to be sanctioned, unless some very positive advantages are certain to be secured by the adoption of the system of parallel wires.

The results obtained in 1862 and 1877 did not indicate the existence of any systematic differences between the observations made with the pair of wires and the single wire when the observations of the comparison stars were properly distributed between the wires. I propose, therefore, to observe *Mars* and the comparison stars in the usual way with the single wire, and without the reflecting prism; and I hope that any directors of the southern observatories who may not be prepared to adopt the Washington scheme will yet observe the planet and comparison stars in the same way.

OBSERVING LIST FROM WASHINGTON CIRCULAR.

From June 20 *to July* 26.

Object.	Mag.	R.A.	δ
		h m s	° ′
O. Arg. S. 20970	7·0	20 50 38	−22 25·1
η Capricorni	5·0	20 58 15	20 16·8
27 Capricorni	6·5	21 3 23	20 59·2
φ Capricorni	5·5	21 9 30	21 5·9
Lacaille 8851	6·0	21 29 5	23 56·2
41 Capricorni	5·8	21 35 51	23 45·0
D.M. − 20° 6923	7·5	21 41 42	20 4·3
Lalande 42700	7·2	21 49 37	21 38·8

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From July 27 to August 10.

Object.	Mag.	R.A. h	m	s	δ °	′
Lacaille 8463	6·2	20	23	11	−22	45·1
„ 8506	7·0	20	31	41	24	36·2
17 Capricorni	5·9	20	39	54	21	54·3
Lacaille 8612	7·0	20	46	42	24	11·2
„ 8813	6·0	21	19	36	24	17·2
„ 8832	7·8	21	24	12	25	40·0
„ 8851	6·0	21	29	5	23	56·2
O. Arg. S. 21562	7·8	21	35	24	22	25·3

From August 11 to September 23.

Object.	Mag.	R.A. h	m	s	δ °	′
O. Arg. S. 20429	7·0	20	15	6	−23	49·1
Lacaille 8463	6·2	20	23	11	22	45·1
„ 8506	7·0	20	31	41	24	36·2
17 Capricorni	5·9	20	39	54	21	54·3
Lacaille 8734	7·0	21	7	1	25	17·2
Lalande 41404	7·5	21	14	32	22	50·7
ζ Capricorni	4·0	21	20	30	22	52·8
37 Capricorni	6·2	21	28	47	20	34·0

List of the Proper Motions in the Line of Sight of Fifty-one Stars.

By H. C. Vogel, Foreign Associate.

In continuation of my communication of 1891 December, on the spectrographic method (vol. lii. No. 2) I hereby transmit the definitive results of that investigation, the observations having been meanwhile brought to a close.

The complete discussion of these researches will be given in the *Publicationen des Astrophysikalischen Observatoriums*, Bd. VII. (Engelmann: Leipzig), which will probably appear during this month (June).

No.	Star.	Epoch.	No. of Plates.	Velocity relative to Sun. (English Miles) Vogel.	Scheiner.	Mean.
1	α Andromedæ	1889·93	2	+ 1·2	+ 4·4	+ 2·8
2	β Cassiopeiæ	1889·04	2	+ 0·8	+ 5·6	+ 3·2
3	α Cassiopeiæ	1890·14	2	− 9·3	− 9·7	− 9·5
4	γ Cassiopeiæ	1888·89	2	+ 2·5	− 6·9	− 2·2
5	β Andromedæ	1889·26	2	+ 5·6	+ 8·3	+ 7·0
6	α Ursæ minoris	1888·90	2	−15·8	−16·3	−16·1